

What is Claimed is:

1. A fiber extrusion pack for extruding molten material to form an array of fibers, comprising:

5 a plurality of split distribution plates arranged in a stack such that each split distribution plate comprises a layer within the fiber extrusion pack, and features on the split distribution plates form a distribution network that delivers the molten material to orifices in the fiber extrusion pack;

wherein each of the split distribution plates comprises a plurality of plate segments with a gap disposed between adjacent plate segments.

2. The fiber extrusion pack of claim 1, wherein adjacent edges of the plate segments are shaped to form reservoirs along the gap.

3. The fiber extrusion pack of claim 2, wherein opposing recesses are respectively formed in the adjacent edges of the plate segments to form the reservoirs.

4. The fiber extrusion pack of claim 2, further comprising sealing plugs disposed in the reservoirs to prevent leakage of the molten material from the fiber extrusion pack.

5. The fiber extrusion pack of claim 4, wherein the sealing plugs are formed by the molten material that leaks into the gap and collects and solidifies in the reservoirs.

6. The fiber extrusion pack of claim 4, wherein the sealing plugs are formed by placing a plugging material in the reservoirs at pack assembly.

7. The fiber extrusion pack of claim 6, wherein the plugging material is solid when placed in the reservoirs and is melted and hardened into the sealing plugs upon placing the fiber extrusion pack in a preheater.

8. The fiber extrusion pack of claim 6, wherein the plugging material is injected as a liquid into the reservoirs and solidifies into the sealing plugs.

9. The fiber extrusion pack of claim 4, wherein the sealing plugs are formed by molten plugging material that solidifies, and wherein the reservoirs lie along angled portions of the gap such that gravity causes the molten plugging material to flow toward and plug exterior openings of the reservoirs.

10. The fiber extrusion pack of claim 2, wherein gaps of adjacent split distribution plates are non-aligned, such that adjacent split distribution plates have separate reservoirs.

11. The fiber extrusion pack of claim 2, wherein reservoirs formed in gaps of adjacent split distribution plates are aligned to form common reservoirs among the adjacent split distribution plates.

12. The fiber extrusion pack of claim 11, wherein the gaps of adjacent split distribution plates are non-aligned between the common reservoirs.

13. The fiber extrusion pack of claim 11, wherein a sealing material is inserted into the common reservoirs upon assembly of the fiber extrusion pack.

14. The fiber extrusion pack of claim 11, wherein a fluid sealing material is injected into the common reservoirs upon assembly of the fiber extrusion pack.

15. The fiber extrusion pack of claim 1, wherein gaps of adjacent split distribution plates are non-aligned.

16. The fiber extrusion pack of claim 1, wherein the plate segments include at least first and second plate segments, the first plate segment including at least one dowel pin hole for receiving a first dowel pin that aligns the first plate segment with corresponding plate segments of other split distribution plates in the fiber extrusion pack, the second plate segment including at least one dowel pin hole for receiving a second dowel pin that aligns the second plate segment with corresponding plate segments of other split distribution plates in the fiber extrusion pack.

17. The fiber extrusion pack of claim 16, wherein the first plate segment includes a first set of dowel pin holes and the second plate segment includes a second set of dowel pin holes.

18. The fiber extrusion pack of claim 1, wherein the plate segments include at least first and second plate segments, and wherein a plate-to-plate alignment of the first plate segment is independent of the plate-to-plate alignment of the second plate segment.

19. The fiber extrusion pack of claim 1, wherein adjacent edges of the plate segments are shaped such that a center portion of the gap has a serpentine shape.

20. The fiber extrusion pack of claim 19, wherein the serpentine-shaped center portion of the gap extends through a pattern of distribution channels formed on the adjacent plate segments.

21. The fiber extrusion pack of claim 1, wherein a continuous distribution pattern is formed on adjacent plate segments, and wherein adjacent edges of the adjacent plate segments are shaped such that the gap extends through the continuous distribution pattern without interrupting the continuous distribution pattern.

22. A split distribution plate for use in a fiber extrusion pack, comprising:

5 a plurality of plate segments arranged side-by-side, the plate segments including features that form a distribution network with features of adjacent distribution plates, the plurality of plate segments comprising at least first and second plate segments whose adjacent edges form a gap in the split distribution plate.

23. The split distribution plate of claim 22, wherein the adjacent edges of the first and second plate segments are shaped to form reservoirs along the gap.

24. The split distribution plate of claim 23, wherein opposing recesses are respectively formed in the adjacent edges of the first and second plate segments to form the reservoirs.

25. The split distribution plate of claim 23, wherein sealing plugs are disposed in the reservoirs to prevent leakage of molten material from the fiber extrusion pack.

26. The split distribution plate of claim 22, wherein the first plate segment includes at least one dowel pin hole for receiving a first dowel pin that aligns the first plate segment with corresponding plate segments of other distribution plates in the fiber extrusion pack, and the second plate segment includes at least one dowel pin hole for receiving a second dowel pin that aligns the second plate segment with corresponding plate segments of other distribution plates in the fiber extrusion pack.

27. The split distribution plate of claim 26, wherein the first plate segment includes a first set of dowel pin holes and the second plate segment includes a second set of dowel pin holes.

28. The split distribution plate of claim 22, wherein a plate-to-plate alignment of the first plate segment is independent of the plate-to-plate alignment of the second plate segment.

29. The split distribution plate of claim 22, wherein the adjacent edges of the first and second plate segments are shaped such that a center portion of the gap has a serpentine shape.

30. The split distribution plate of claim 29, wherein the serpentine-shaped center portion of the gap extends through a pattern of distribution channels formed on the first and second plate segments.

31. The split distribution plate of claim 22, wherein a continuous distribution pattern is formed on the first and second plate segments, and wherein the adjacent edges of the first and second plate segments are shaped such that the gap extends through the continuous distribution pattern without interrupting the continuous distribution pattern.

32. A fiber extrusion pack for extruding molten material to form an array of fibers comprising the distribution plate of claim 22.

33. A spunbond apparatus for generating an array of synthetic polymer fibers, comprising a spin beam, wherein the spin beam comprises a spin pack and at least one metering pump for delivering molten polymer to the spin pack, and wherein the spin pack includes at least one distribution plate according to claim 22.

34. A method of forming a fiber extrusion pack for extruding molten material to form an array of fibers, the method comprising:

5 arranging a plurality of distribution plates such that each distribution plate comprises a layer within the fiber extrusion pack, and features on the distribution plates form a distribution network that delivers the molten material to orifices in the fiber extrusion pack; and

constructing at least some of the distribution plates as split distribution plates comprising a plurality of side-by-side plate segments with a gap disposed between adjacent plate segments.

35. The method of claim 34, further comprising:

shaping adjacent edges of the plate segments to form reservoirs along the gap.

36. The method of claim 35, further comprising:

forming opposing recesses in the adjacent edges of the plate segments to form the reservoirs.

37. The method of claim 35, further comprising:

forming sealing plugs in the reservoirs to prevent leakage of the molten material from the fiber extrusion pack.

38. The method of claim 37, wherein the sealing plugs are formed by the molten material that leaks into the gap and collects and solidifies in the reservoirs.

39. The method of claim 37, wherein the sealing plugs are formed by placing a plugging material in the reservoirs at pack assembly.

40. The method of claim 39, further comprising:
placing a solid plugging material in the reservoirs;
heating the solid plugging material, such that the solid plugging material melts and then hardens into the sealing plugs.

41. The method of claim 39, further comprising:
injecting the plugging material as a liquid into the reservoirs, wherein the plugging material solidifies into the sealing plugs.

42. The method of claim 37, wherein the sealing plugs are formed by molten plugging material that solidifies, and wherein the reservoirs lie along angled portions of the gap such that gravity causes the molten plugging material to flow toward and plug exterior openings of the reservoirs.

43. The method of claim 35, wherein the fiber extrusion pack is formed such that gaps of adjacent split distribution plates are non-aligned, wherein adjacent split distribution plates have separate reservoirs.

44. The method of claim 35, wherein reservoirs formed in gaps of adjacent split distribution plates are aligned to form common reservoirs among the adjacent split distribution plates.

45. The method of claim 44, wherein the gaps of adjacent split distribution plates are non-aligned between the common reservoirs.

46. The method of claim 44, further comprising:
inserting a sealing material into the common reservoirs upon assembly of the fiber extrusion pack.

47. The method of claim 44, further comprising:
injecting a fluid sealing material into the common reservoirs upon assembly of the fiber extrusion pack.

48. The method of claim 34, wherein gaps of adjacent split distribution plates are non-aligned.

49. The method of claim 34, wherein the plate segments include at least first and second plate segments, the method further comprising:

forming the first plate segment with at least one dowel pin hole for receiving a first dowel pin that aligns the first plate segment with corresponding plate segments of other split
5 distribution plates in the fiber extrusion pack; and

forming the second plate segment with at least one dowel pin hole for receiving a second dowel pin that aligns the second plate segment with corresponding plate segments of other split distribution plates in the fiber extrusion pack.

50. The method of claim 49, wherein the first plate segment is formed with a first set of dowel pin holes and the second plate segment is formed with a second set of dowel pin holes.

51. The method of claim 34, wherein the plate segments include at least first and second plate segments, and wherein a plate-to-plate alignment of the first plate segment is independent of the plate-to-plate alignment of the second plate segment.

52. The method of claim 34, further comprising:

shaping adjacent edges of the plate segments such that a center portion of the gap has a serpentine shape.

53. The method of claim 52, wherein the serpentine-shaped center portion of the gap extends through a pattern of distribution channels formed on the adjacent plate segments.

54. The method of claim 34, further comprising:

forming a continuous distribution pattern on adjacent plate segments;

shaping adjacent edges of the adjacent plate segments such that the gap extends through the continuous distribution pattern without interrupting the continuous distribution pattern.

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